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USSR Report

AGRICULTURE

(FOUO 5/79)

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ROLE OF CREDIT IN STRENGTHENING KOLKHOZ ECONOMY DISCUSSED

Moscow VOPROSY EKONOMIKI in Russian No 7, Jul 79 pp 75-84

[Article by V. Kochkarev: "The Role of Credit in Strengthening Kolkhoz Economy"]

[Text] Each year kolkhozes are being given increasing amount of long and short-term credit by Gosbank USSR for the creation of fixed and working capital, for covering seasonal production needs and for realizing expanded agricultural production. Whereas during the 7th Five-Year Plan the average total of short-term credit issued to kolkhozes was 4.3 billion rubles and 8.7 billion rubles during the eighth, during the Ninth Five-Year Plan this total almost doubled, reaching an average of 16.9 billion rubles, and during 2 years of the current five-year plan it is 21.1 billion rubles. Between 1964 and 1978 the volume of long-term loans for capital investments increased by a factor of 3.7 to 4,483 million rubles. Basically, kolkhozes used long-term credit to build production structures and to buy technology. The proportion of credit in the capital expenditures of kolkhozes was one-third.

At the present time all kolkhozes in the country are enjoying direct bank credit in two variants. One group of kolkhozes (20 percent) is given credit according to the first variant, in which Gosbank issued credit from a separate loan account for the acquisition of commodity-material valuables necessary for production, for wages to kolkhoz farmers and for other production expenditures except capital investments and capital repairs. Credit is issued to kolkhozes according to the second variant (80 percent) from a special current account for all production expenditures and expenses. The use of the specific variant depends upon the characteristics of agricultural production in the particular region of the country.

The transition to direct bank credit for kolkhozes allows us to consider the characteristics of the circulation of capital and to strengthen the effect of credit on the development and consolidation of the economies and finances of kolkhozes. The new credit regulations have created more favorable conditions for the timely issuance of monetary assets to kolkhozes and for a growth in agricultural production output. There has been a strengthening of controls by Gosbank USSR over the production and financial activities of kolkhozes and over their adherance to the basic principles of cost accounting.

Direct bank credit has significant advantages over the previously existing system of two-channel credit (monetary advances of procurement organizations and Gosbank credit), but it is not devoid of shortcomings. These include the issuance of credit on the basis of the actual availability of the kolkhoz's own working capital without considering its replenishment, the absence of current accounts in kolkhozes that are credited according to the second variant and the examination of credit supplies according to the data of the balance, as is done in the enterprises of all branches of the economy. A more serious shortcoming has to do with the fact that credit for production expenditures in both variants is issued without consideration of the status and replenishment of internal assets or working capital. As a result many kolkhozes do not feel any responsibility for preserving and replenishing these funds. Thus, whereas during the period 1966-1977 the working capital of kolkhozes increased from 15.6 billion rubles to 38.3 billion rubles, or by a factor of almost 2.5, including working production funds--from 10.2 billion rubles to 29.1 billion rubles or by a factor of over 2.8, internal working capital increased during this period from 10.9 billion rubles at the end of 1965 to 15.7 billion rubles in early 1978, or only by a factor of 1.4.

During the given period, as the analysis shows, there was a basic change in the structure of working assets in kolkhozes as well as in the sources for covering them, which can be seen from the following table:

	As of 1 Jan 66		As of 1 Jan 78	
	Total In Millions of Rubles	% of Total	Total In Millions of Rubles	% of Total
Availability of working assets	15,614	100.0	38,323	100.0
Including:				
working production assets	10,200	65.3	29,060	75.8
turnover funds	5,414	34.7	9,263	24.2
Sources for covering working capital:				
internal working assets	10,907	69.3	15,713	41.0
remains of special funds	418	2.7	3,406	8.9
assets not included in accouts for capital investments	390	2.5	939	2.4
Total internal resources	11,715	75.0	20,058	52.3
Gosbank loans	847	5.4	14,183	37.0
credit debts	3,052	19.6	4,082	10.6
Total sources	3,899	25.0	18,265	47.7

The above data shows that the proportion of production funds--the most active portion of working capital--increased during the last 12 years by 10.6 points with an accompanying decrease in the proportion of circulating assets.

The growth in the proportion of production working capital was caused by the growth of production reserves and incomplete production in connection with the increase in the total volume of kolkhoz production, the cost of young animals and of fattening livestock as well as the proportion of industrial production (commodity materials) within production funds. The growth of expenditures for incomplete production was affected also by the inclusion in them of wage payments as a result of the transition to guaranteed wage payments.

The decrease in the proportion of circulation funds, consisting of ready products, monetary assets and current accounts, can be explained by the transition of kolkhozes in 1966 to a monetary payment of wages and by the supplanting of natural accounts (products) due to this with kolkhoz farmers being paid wages as well as by the direct system of short-term credits for kolkhozes that began in 1967 and that planned for the issuance of credit to kolkhozes for wage payments. In connection with this the kolkhozes no longer found it necessary to accumulate money in accounts in order to pay kolkhoz wages. Within the structure of sources for covering working capital during this period there was a significant decrease (28.3 points) in the proportion of kolkhoz working capital and an increase in the proportion of USSR Gosbank credit (31.6 points) to cover production reserves and expenditures, the remains of finished products and reserves calculated for them (credited assets). In 1977 the proportion of credits was 46.3 percent as compared with 7.5 percent in 1965.

The change in the structure of sources for covering working capital was affected by the growth of the cost of agricultural production resulting from bad weather over a period of several years as well as by the increase in prices for spare parts and repair materials, oil products, mixed fodder and some other types of industrial products, the growth of estimated costs for building and the growth of taxes for transporting loads by truck, by the changes in the evaluation of fixed capital and by the introduction of new (increased) norms for its amortization. In connection with the introduction of guaranteed wages and with the measures to raise the material incentives of kolkhoz farmers there was a significant growth in expenditures for wage payments in kolkhozes. In 1977 the wage fund in kolkhozes was 16.9 billion rubles, whereas in 1965 it was 11.0 billion rubles. The resolution of the CC CPSU and USSR Council of Ministers of 16 May 1966, "On Increasing Material Incentives for Kolkhoz Farmers in Developing Public Production," planned that the introduction of guaranteed wages for kolkhoz farmers and the continued increase of their level would be realized on the basis of increasing agricultural production output and of a growth in labor productivity. This condition was also included in the kolkhoz Ustav. However, the given condition was not fulfilled either in the eighth or ninth five-year plans on many farms.

Because a balance was not striked between the growth of wages and labor productivity and because of other violations during the distribution of income, there was an annual increase in income used by kolkhozes for consumption and a decrease in the share of savings. Thus, whereas during

the years of the Eighth Five-Year Plan an average of 25.3 percent of gross income was directed towards savings, during the ninth 22.5 percent was directed towards this goal, and only 18.5 percent during the 2 years of the 10th Five-Year Plan.

The profitability of production decreased in a number of kolkhozes as a result of serious shortcomings in economic and financial activities leading to large unproductive expenditures and losses and also as a result of other reasons (incomplete deliveries of material-technical resources, shortages in the utilization of technology, fertilizers and other resources). Under these conditions the growth of internal working capital of kolkhozes lags behind the pace of growth of production reserves, the expenditure of incomplete production and other working assets. Thus, production reserves and expenditures for incomplete production and remains of finished products and assets for these grew during the period 1966-1978 by a factor of 2.7, whereas the increase in internal working capital was only by 44 percent. In 1975-1977 internal working assets decreased in absolute sums for all kolkhozes in the country because of great financial losses. In connection with this the absolute total and proportion of Gosbank credit is increasing in the formation of working capital.

The decrease in the proportion of internal working assets in the formation of production reserves and expenditures was also affected by the fact that in a number of kolkhozes less attention was given to the development, preservation and purposeful utilization of internal working assets. Thus, whereas in 1966 kolkhozes made deductions from clear income to replenish internal working assets totaling 2,345 million rubles, or 32.4 percent, during subsequent years these deductions dropped sharply and already in 1977 they were 897 million rubles, or 13 percent. During this period internal working assets decreased from 98.9 percent to 51.3 percent of the cost of credit assets. A group of kolkhozes in the Uzbek SSR having a profit level of 25.1 percent in 1977 deducted only 1.6 million rubles to replenish internal working assets, or 5.4 percent of clear income. At the same time in these kolkhozes the free surplus from special funds equalled only 11.2 million rubles at the end of 1977, including 8.4 million rubles in the reserve fund. There was a similar situation in this republic in a group of kolkhozes with an average profitability of 25.5 percent and internal working assets of up to 30 percent. Deductions for replenishing the indivisible fund for working capital in these enterprises equalled 2.3 million rubles, or 4.4 percent of clear income. The surplus from special funds equalled 17.2 million rubles, including a reserve 15.9 million rubles. Such cases exist in groups of kolkhozes in Tadzhikistan, Turkmenia and other union republics. In the Moldavian SSR 16 kolkhozes with supplies of up to 30 percent of internal working assets directed over three-fourths of their clear income into the consumption fund and did not deduct anything to replenish internal working assets.

With the significant drop in deductions to replenish internal working assets many kolkhozes do not secure their preservation, tolerate the writing off of accumulated assets to cover losses and the discounting of commodity-material

valuables in connection with the gratuitous transfer and reformation of the balance and for other reasons. In 1966-1977 the total that was written off was 8.5 billion rubles, or 63.9 percent of the deductions made during this period from clear income for working capital. In 1975-1977 the kolkhozes of Voronezhskaya Oblast wrote off a total of 197.5 bmillion rubles of internal working assets, or 13 times more than the deductions made from income to replenish these assets. Moreover, considerable sums of working capital are diverted by kolkhozes for capital investments and for debts. At the beginning of 1978 the immobilization of working capital comprised over 1.2 billion rubles, for debt securities--about 1.2 billion rubles. The aforementioned shortcomings in the development, preservation and utilization of working assets in kolkhozes are also the result of the absence of norms.

A survey has shown that there is great differentiation in the level of supplies of internal working assets in kolkhozes and that the proportion of these assets in the development of working capital has been decreasing in recent years. In early 1978 almost 3,500 kolkhozes had more of these assets than the total cost of transitional production reserves, expenditures for incomplete production and surpluses of finished products. At the same time a significant portion of the enterprises did not have them at all. In the kolkhozes of some republics the average availability of internal working capital in early 1978 comprised considerable quantities. Thus, in the kolkhozes of the Lithuanian, Moldavian and Estonian republics the figures were from 86.8 to 95.3 percent; in the Uzbek SSR--103.4 percent. In the kolkhozes of the Uzbek, Georgian, Azerbaijan, Moldavian, Armenian and Estonian union republics the average availability of internal working assets in kolkhozes increased as of 1 January 1978 as compared with 1 January 1972. In other republics it decreased, and with great significance in the RSFSR--from 69.6 percent to 29.7 percent and in the Kazakh SSR--from 65.3 percent to 21 percent.

Data on surveys regarding the availability of internal working assets in kolkhozes on 1 January 1972, 1975 and 1978 also attests to the considerable changes in the proportion of groups with various availabilities of assets (see table on next page).

The data in the table shows that during the period from 1 January 1972 to 1 January 1978 the proportion of groups of kolkhozes with an availability of internal working assets of from 50.1 to 100 percent and more decreased by 18.6 points and that there was an increase in the proportion of kolkhozes with an availability of internal working assets of 50 percent and lower. Here there was an especially great increase in the proportion of groups of kolkhozes with an availability of internal working assets of up to 30 percent (by 7.0 points) and of kolkhozes that have spent their internal working assets (by 9.4 points). Most of the debts to USSR Gosbank (in early 1978) belonged to the kolkhozes with a low level of availability of internal working assets.

Groups of Kolkhozes According to Availability of Internal Working Assets	As of 1 Jan 72		As of 1 Jan 75		As of 1 Jan 78	
	No. of Kolkhozes	Proportion of Groups in Total No. of Kolkhozes (%)	No. of Kolkhozes	Proportion of Groups in Total No. of Kolkhozes (%)	No. of Kolkhozes	Proportion of Group in Total No. of Kolkhozes (%)
Over 100 percent	4,872	15.2	3,650	12.4	3,471	13.0
From 80.1 to 100 percent	8,526	26.5	6,505	22.0	4,927	18.5
From 50.1 to 80 percent	11,241	35.0	9,775	33.1	7,090	26.6
From 30.1 to 50 percent	3,395	10.5	3,911	13.3	3,401	12.7
Up to 30 percent	2,502	7.8	3,435	11.6	3,950	14.8

The studies also showed that two groups of kolkhozes (those with an availability of internal working assets of up to 30 percent and those with none) comprising 29.2 percent of the total number of kolkhozes hold 70.3 percent of all loan debts for production expenditures among kolkhozes in the country, including 78.9 percent of overdue and extended loans. An analysis of a survey of kolkhozes as of 1 January 1978 attests to the fact that the level of availability of enterprises of internal working assets depends directly on the status of the economy and the profitability of the enterprise. Thus, in the group of kolkhozes having an average availability of internal working assets of 124 percent, profitability equalled 30.6 percent whereas in the other group where the availability of internal assets was 17.1 percent the profitability level was only 0.4 percent.

The development of kolkhoz production and kolkhoz-cooperative property requires the continued improvement of credit relations. The farther forward kolkhoz production moves, the more complex the tasks before the credit system. At the present time tests are being conducted in 346 enterprises in 13 union republics on the use of a new credit system for kolkhozes which takes the norm of internal working assets into consideration. A current account is opened for these kolkhozes in Gosbank. As an analysis shows, in the enterprises that have moved to this system there has been an improvement in the distribution of income into the consumption and savings funds and in connection with this there has been an increase in the deductions to replenish the indivisible fund as a whole and to replenish the indivisible fund in the section of working capital. Thus, the kolkhozes that are under the test credit system increased deductions for replenishing the indivisible fund by 21.4 percent in 1977 as compared with 1976, and their proportion in clear income increased by 1.7 points and by 9.6 points in the section for deductions to replenish working assets. Debts decreased by 29.4 percent and funds frozen for capital investments--by 4 times.

One of the most important problems is the economic foundation for the volume of credit input into the national economy and its individual branches. Under conditions of improving the economic mechanism, of the continued development of the basic principles of self-financing, when the great majority of enterprises and organizations cannot exist without credit because of the characteristics of production and the circulation of assets, economic and financial activities depend greatly on the optimal nature of credit investments into production. According to the degree of acceleration of the pace of growth in public production, basic qualitative and quantitative changes occur in the sources for developing working assets. These changes have a definite effect on the size and structure of credit investments into the production activities of an enterprise.

Some economists believe that the higher the level of credit investments in the national economy, the more active the effect of Gosbank on the production and financial operations of enterprises and organizations and the greater the effectiveness of utilizing internal and borrowed assets. From this the conclusion is drawn that sooner or later credit will be the single source for forming working assets, and that the internal assets of economic organs will become meaningless, their role will weaken and they will be of secondary importance. In our opinion, when the question is looked at in this way, credit becomes absolutized as one of the sources of forming working capital. At a certain stage, for which there is a place in the practice of crediting kolkhozes, sovkhozes and enterprises of a number of other branches of the national economy, credit investments actually do increase at a more rapid pace than the internal assets of the enterprise. However, the given tendency cannot be characterized as the main one in the credit policies of Gosbank.

Credit and the internal assets of an enterprise organically supplement and strengthen each other when developing working capital and when securing the normal production and financial operations of an enterprise. Under self-financing conditions credit is not a source of developing working capital that is thrust upon the enterprise by directives from above, but rather an objective necessity resulting from the characteristics of the circulation of assets and the specifics of production, a stable element in the formation of working capital. In our opinion it would be more correct to admit the interrelationship of internal assets and credit rather than to single out one element as the source for the financial assets of the others. Here the relationship between internal assets and credit must be specific for each enterprise and kolkhoz while considering the specific features of production, profit distribution, interrelationship with Gosbank and the budget, etc. Credit must function in covering production reserves and expenditures in economically-based quantities while taking into consideration the fact that the internal reserves of an enterprise or kolkhoz are secured by the constant minimal reserves of material value within normative limits.

Unfortunately, our economic science still has not developed a well-founded methodological approach which would allow us to indicate the limits of credit investments in the national economy. The solution of this problem has an important significance not so much for theory as for the practice of credit relations between Gosbank and the branches of the national economy as well as for the planning and regulation of monetary circulation and interrelationships with the budget. In our opinion, under self-financing conditions credit limits must be based first of economically-based needs of constantly-growing production. Here credit must cover the above-norm needs of production in material values arising in the course of the circulation of assets. Credit should not be drawn into production to cover losses and other non-productive expenditures. If we examine credit limits within a more extensive economic plan then they must be tied to the volumes of the combined public product, working capital and the economically-based sources for its development and the volumes of the formation and utilization of the general state loan fund.

In analyzing the questions of credit investments and sources of forming working capital it is essential to know in detail how these sources have changed quantitatevely, what qualitative changes have taken place during the specific period, what the internal relationship of the enterprise is to replenishing its assets to the established norm, and what the position of Gosbank is in connection with the growth of working capital and its use.

In examining the credit relations of Gosbank and kolkhozes it should be emphasized that the use of credit in the formation of working capital is not uniform. Many economically-strong kolkhozes do not utilize bank credit and cover all production expenditures and expenses with internal assets. As of 1 January 1978 13.3 percent of all the kolkhozes in the country did not use Gosbank credit. In the Lithuanian SSR credit was not used by 40.2 percent of kolkhozes; in Estonia--50.7 percent; in the Uzbek SSR--11.4 percent; in Moldavia--by 12.1 percent; in Turkmenia--7.1 percent, and in the Tadzhik SSR--33.5 percent. Many kolkhozes do not include obtaining short-term credit for production expenses in their production and financial plans. For example, in 1978 plans only 85.6 percent of the country's kolkhozes included the use of loaned assets in the form of short-term loans for economic turnover.

The availability in many kolkhozes of free internal assets which significantly surpass the normal needs for covering production expenditures and expenses contradicts, on the one hand, the strengthening of the principles of self-financing and weakens the incentive of enterprises to utilize their assets more effectively. On the other hand, to a significant degree there is a decrease in the credit and economic effect of Gosbank on the production and financial operations of the kolkhoz. When examining this question it is important to consider that many enterprises that do not plan for short-term loans actively seek long-term loans for capital investments, especially since this credit if issued for long periods of up to 20 years and at a lower rate of interest--0.75 percent of the annual. Thus, the study has established that kolkhozes with an availability of internal working assets of over 100 percent (average availability in this group of enterprises in the country--

124 percent) in 1977 were issued long-term credit for capital investments totalling 225.7 million rubles. These kolkhozes, which already had a surplus of internal working assets, deducted another 238.9 million rubles to replenish them in 1977. After this the surplus of internal working assets at the end of the year was 779.8 million rubles. Many of these kolkhozes received long-term credit for capital investments that could have been issued to enterprises which actually needed the credit.

In 1977 only 1,018 kolkhozes in the RSFSR having surplus internal working assets received long-term credit for capital investments totalling 113.5 million rubles. This situation developed because at the present time there is no econmically-based methodology for distributing income into the savings and consumption funds and for directing income into fixed and working capital funds. In connection with this many strong enterprises direct a significant portion of the clear income they are trying to distribute into the fund for working capital, resulting in more than is needed in this area. Naturally, in such a situation the necessity for short-term credit will be insignificant or totally non-existant. Nevertheless in these enterprises a need for long-term credit for capital investments develops (because deductions into fixed funds turn out to be somewhat small).

At the present time all kolkhozes, regardless of their economic status, are required to utilize long- and short-term credit. In determining the size of the short-term loan we should start with the consideration that all kolkhozes must have internal assets within the limits of economically-based norms. Taking this into account, assets from clear income should be directed into replenishing internal working assets. Thus, the assets that are singled out by the kolkhoz to replenish working assets above the essential need will be directed into the formation of fixed funds. As a result in such an enterprise there will be less need for long-term credit for capital investments. This credit can then be issued to low-profit kolkhozes for the development and strengthening of the material and technical base.

The determination of effective quantities of credit for realizing economic operations and for capital investments places the question of the resources of the loan fund that is used for these goals into a new light. For example, the sources for covering long-term loans should, as a rule, be assets that were earmarked for the reproduction of fixed funds. Nevertheless, practical experience has shown that at the present time in addition to these sources for long-term loans for the national economy assets are being used that are earmarked for short-term credit. This has a negative effect on the use of existing resources and on the status of money circulation. With the aim of further developing production and raising its effectiveness, an economically-founded direction for credit investments in the national economy so that each form of credit would correspond to the sources earmarked to cover it. The assets of the fund that is earmarked to credit capital investments should be utilized strictly for these purposes.

Under conditions of the consistent growth in credit investments into agricultural production and the active affect of credit on improving the qualitative and quantitative indicators of kolkhozes, the principles of credit organization acquire greater and greater significance. There are various points of view about this question in economic literature. Nevertheless, most economists agree that credit must be earmarked for a special purpose and that it must be needed and security must be provided for it in the form of material valuables. These must be included in the basic principles for organizing credit. At the present time the credit system for kolkhozes and for all enterprises and organizations in the national economy can no longer be based on principles that were established during the 1930's.

In our opinion, credit can have an active effect on strengthening the economy and finances of enterprises and kolkhozes thanks to the utilization of organizational principles such as planning, purposefulness, return, security, economically-based credit direction into main operation and capital investment, and effectiveness of utilizing credit. The basic principles of credit organization, which are closely related to the economics and finances of enterprises and kolkhozes, will be developed and consolidated even more. The strength and depth of the economic effect of Gosbank on the fulfillment of qualitative and quantitative indicators in production is determined to a considerable extent by the correct application and unified action of all the basic principles of credit organization and by the constant and timely improvement of the credit system and of the accounts of the national economy. Naturally, enterprises and kolkhozes are required to observe the basic credit principles strictly.

Credit planning for kolkhozes differs from credit planning for other branches of the national economy in that it includes the issuance of loans and the balance on credit loans. This allows us to more fully consider the kolkhoz's need for credit for production expenditures.

In our opinion, in order to raise the effectiveness of utilizing credit assets,credit and cash plans must be examined quarterly by local organs in a rayon, oblast and republic cross-section. It is also important that resources and their purpose be earmarked in each ministry and individual enterprise.

The coordination of the credit that is issued and its resources will allow USSR Gosbank to realize more active controls over the fulfillment of qualitative and quantitative indicators in each ministry, department and enterprise. Current and future credit plans for long-term and short-term credit in resources as well as their purposes must be of a directive nature and must be part of the national economic plan. The complex and balanced credit plans must reflect the indicators for production and sales, resources being directed at the financing and crediting of normal production needs, and economically-based relationships between the sources for forming fixed and working capital.

In examining the question of the continued improvement in credit planning, it is essential to consider that with the increase in production volume and

product sales, and with the expansion of economic and financial ties between enterprises and organizations and the financial-bank system there is a growth in credit investments into the national economy and the role of gcredit is strengthened as far as raising the effectiveness of public production. In connection with this in credit planning for the national economy as a whole as well as for individual branches we cannot rely only on experience. A large quantity of various data in the area of credit and the production and financial operations of enterprises under current conditions can be processed in a timely way only within the framework of an automated system of management. For this reason, when developing credit plans it is essential already now to utilize computer technology and to develop the basic data for it.

Direct bank credit and the growth of credit investments into kolkhoz production requires credit security with commodity-material valuables. The financial condition of the kolkhoz depends to a considerable degree on the correct determination of credit needs. Since in kolkhozes there is no examination of credit securities, in contrast to the procedure in the enterprises and organizations of other branches of the national economy, the result is that in some kolkhozes there is a surplus of commodity-material valuables and in others there is a shortage. Naturally, in such a case the responsibility of the kolkhoz to correctly and efficiently utilize internal and loaned assets decreases. For this reason, the introduction of examinations of material securities for credit and the inclusion of non-plan sources in addition to internal assets and credit for covering working assets will encourage, on the one hand, the consolidation of self-financing in kolkhozes and their incentive to fulfill production financial plans with the fewest expenditures of labor and assets, as well as a more efficient distribution of income into savings and consumption funds. On the other hand, credity security using material valuables will have a positive effect on strengthening the circulation of money in the country.

The problem of the return on credit arises with the increase in the volume of credit investments into kolkhoz production. Considering the necessity of repaying loans on schedule, kolkhozes find that during the production process and when selling products they must budget income and expenditures, expend existing assets more economically, achieve better indicators in production and financial operations and utilize internal and loaned assets more effectively. The transition of kolkhozes to direct crediting generally resulted in a better organization of loan repayments by kolkhozes. At the same time, some kolkhozes cannot repay loans on schedule because of natural calamities. Because the organs of USSR Gosstrakh [Main Administration of State Insurance] pay kolkhozes no more than 50 percent of losses due to natural calamities, naturally the kolkhozes are placed in great production and financial difficulties. The kolkhozes fall far behind in their payments to Gosbank for loans and to suppliers for material goods. The size of the extended loans increases. Under such conditions more attention should be given to improve the state insurance system of kolkhoz property, i.e. the existing insurance payments should be increased.

The growth of fixed and working capital, the increase in the volume of credit investments and the necessity to further consolidate the principles of self-financing have made it urgent to raise the effectiveness of the utilization of internal and loaned assets by enterprises, organizations and kolkhozes. During the process of crediting while utilizing economic sanctions and privileges this indicator is poorly used.

In economic literature there are various views on the question of the effectiveness of credit utilization. We share the opinion of economists who examine credit effectiveness from the point of view of the efficient utilization by enterprises of internal assets with the goal of achieving the best production indicators and of strengthening the principles of self-financing. In 1977 the kolkhozes of the Ukraine received 5 rubles 15 kopecks short-term credit for each rubles of gross production and 0.85 rubles of clear income; of the Belorussian SSR--5 rubles 31 kopecks and 0.97 rubles respectively; of the Uzbek SSR--13 rubles 21 kopecks and 2 rubles 82 kopecks respectively; of the Moldavian SSR--8 rubles 63 kopecks and 1 ruble 64 kopecks respectively. At the same time we should not diminish the importance of the enterprise's internal assets, which it uses in the production and sale of products.

In our opinion, in its operations Gosbank must consider the kolkhoz indicators on the utilization of fixed and working capital as well as credit. During the first stage it would be expedient to issue credit to an enterprise, as a test, while considering its effectiveness in utilizing internal and loaned assets. Naturally, the basic principles of credit organization must be observed while acquiring new content. In those cases where the enterprise utilizes existing assets effectively, the credit regiment should be more preferential. And in reverse, with the non-effective utilization of credit and fixed and working capital the credit regiment should be more severe in order that credit have a more active effect on the fulfillment by the enterprise of all plans, in order to increase production profitability and to accelerate the turnover of assets. In conducting experiments on the new system of credit it is essential to plan for giving more extensive rights to the directors of rayon institutions of USSR Gosbank in the selection of variants and in their practical application.

In examining the questions of raising the role of credit in the development of the public economy our basis is that the better the credit mechanism functions, the more perfect the credit planning system in a branch and territorial cross-section, the closer the relationship between assets and their purposeful utilization, the more complete the coordination between the issuance of loans and their effective use, then the more effective the action of Gosbank will be on strengthening the economies and finances of enterprises and kolkhozes.

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GEOGRAPHICAL PROBLEMS IN AGRICULTURAL DEVELOPMENT OF SIBERIA

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Editorial Board: Corresponding Member of the USSR Academy of Sciences V.N. Saks (Editor-in-Chief), Candidate of Geological-Mineralogical Sciences S.G. Beyrom, Academician A.P. Okladnikov, Doctor of Geographic Sciences M.N. Kolobkov, Candidate of Geological-Mineralogical Sciences V.S. Kuskovskiy, Doctor of Geological-Mineralogical Sciences V.A. Nikolayev and Candidate of Geological-Mineralogical Sciences S.I. Chernousov.

Brief Description

This collection contains works devoted to evaluating the natural conditions of Siberia in connection with the agricultural development of the territory. Descriptions are furnished for the soils in the aeration zone, the soil cover and soil climatology, forecasts are made concerning the hydrological and hydrochemical regimes of rivers and ground waters and information is provided on the utilization of lakes and reservoirs.

The book was developed for specialists engaged in studying, transforming and utilizing natural conditions in connection with the agricultural development of Siberia.

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Preface

[Text] Scientific-technical progress in our country has raised an important question concerning the interaction of man and his natural environment and the methods to be employed for the complete reworking of nature and for protecting nature. This question is especially important in connection with the agricultural development of Siberia in light of the decisions handed down during the 25th CPSU Congress. Moreover, included in the sphere of use are the territories of different climatic zones and diverse geomorphological elements of the earth's crust, which differ substantially in terms of the ground, hydrogeological and soil conditions.

During this modern era, agricultural lands can be used in an efficient and high quality manner only if an extensive and complete study is carried out on the natural conditions; geological and geomorphological structure of the territories; physical-mechanical properties of the ground in the zone of aeration and the soils; the soil-climatic conditions for different regions and, finally, the stratification and chemism conditions of the underground and river waters used during irrigation operations.

In the agricultural development of the territory of Siberia, considerable importance is being attached to utilizing numerous lakes and reservoirs in its western portion.

The majority of the problems mentioned are examined in this book.

It is the hope of the Editorial Board that this book will be of considerable theoretical and practical interest to agricultural specialists, planning institutes , scientific workers and geographers engaged in the study and utilization of natural resources for the agricultural development of Siberia.

I. Ground, Soils and Soil Climatology

Soil Cover and Intensification of Agricultural Production in Western Siberia

Among the modern scientific problems, tremendous importance is being attached to understanding the interrelationships between man and the environment in which he lives -- the biosphere. A study of its principal resources requires an intense and comprehensive analysis of the role and importance of soil cover, characterized by great geochemical energy of live substance.

Soil cover -- the most important element of the biosphere, the principal physical condition for man's existence, the object of man's labor, the

location for his settlements and cities and, a point which is of special importance, the principal means for agricultural production.

The destruction of natural vegetation, particularly forest growth, extensive plowing of soils, thoughtless use of toxic chemicals and diverse industrial influences lead to degradation of the soil cover on an extensive scale, cover which was created over thousands of years. Such degradation is either irreversible or very difficult to correct.

At the same time, soil cover appears as a natural phenomenon -- a component of the biosphere and one which differs from other biosphere components in the sense that it can be controlled more easily. Moreover, the soil cover aids us in smoothing out the unfavorable factors of the environment and in utilizing the resources of the atmosphere more fully -- radiation, heat and moisture, in the interest of raising plant productivity.

Thus a most important reserve for raising the productivity of agricultural production is that of taking advantage of the diverse but not always utilized opportunities for improving the quality of the soils, raising their productivity and using them in the correct manner.

The developed southern and agricultural portion of Western Siberia is characterized by very unique natural-economic conditions. And despite this fact the crop varieties, the agricultural practices employed in cultivating them and the methods for utilizing the soils (cultivation, use of fertilizers and land reclamation methods) historically came to Siberia from the European regions of the country and by no means were always suited for the conditions found in Siberia.

The plant life is extremely vulnerable to the spring period, characterized by frequent moisture shortages and the return of cold weather, to frequent droughts and dry winds in the summer, saline, solonetz and water-logged lands and to a brief frost-free growing season and in places to a cold and rainy end to such seasons -- all of these unfavorable (for plant development) ecological conditions require the development and use of a special and specific Siberian strategy for farming -- plant breeding, crop husbandry, agricultural practices, land reclamation and utilization of the soil cover. Thus the prospects for the progressive development of agricultural production in Western Siberia are greatly dependent upon correct, sensible and intensive use of the land.

The soil cover in the zone of intensive agricultural development in Western Siberia, as a result of work carried out by IPA [Institut Pochvovedeniya i Agrokhimii; Institute of Soil Science and Agrochemistry] of the Siberian Branch of the USSR Academy of Sciences and other scientific and planning-production institutes, has been studied in considerable detail. Medium-scale soil charts have been composed for a majority of the oblasts, soil regionalization has been carried out and detailed soil descriptions, including their production qualities, have been made available.

All of these materials are considered to be extremely important scientific documents for the planning and organization of agricultural production and for the correct and most productive use of land resources.

Exactly what is the soil cover of Western Siberia?

In the majority of the oblasts it is extremely complicated and complex. Its soil components differ in terms of their genesis and, a point which is especially important, also in terms of their production-technological, agrochemical and land reclamation qualities. These differences are observed not only within the boundaries of one zone or sub-zone, but also on comparatively small tracts on the order of individual land holdings and even crop rotation fields and this complicates to a considerable degree the correct use of soils with regard to agricultural practices, fertilizer applications, land reclamation and, finally, the high quality structure of the crops.

On the whole, the soil cover in Novosibirskaya Oblast is considerably worse than that found in Altayskiy Kray or Kemerovskaya Oblast and somewhat better than that in other oblasts of Western Siberia -- Tomskaya, Omskaya and Tyumenskaya oblasts.

An evaluation of the land on the basis of quality was carried out -- an appraisal of the soil cover in all of the oblasts and Altayskiy Kray of Western Siberia revealed that the average quality index for soils in Novosibirskaya Oblast is only 55 points, whereas it is evaluated at 75 points for Altayskiy Kray. The best soil for Western Siberia -- leached chernozem -- was used as the 100 point standard. Thus in Novosibirskaya Oblast the quality of the soils in the first group -- general agricultural use -- is evaluated at 54 points, the second group -- mainly feed lands -- 40 and the third group -- land reclamation fund -- only 10 points. In Altayskiy Kray, the area of soils having such a low quality index is definitely less.

For individual administrative rayons within Novosibirskaya Oblast, the average quality indices also differ to a substantial degree. For example, the highest quality indices are found for the soil in the Eastern (78 points) and the Prigorodnoy (72 points) zones. The lowest quality index was recorded for the soil in Kulundinskaya Zone -- 46 points and in the Southern Barabinskaya and Central-Barabinskaya zones -- 33 and 34 points respectively.

Studies have shown that a comparison of the quality indices against average productivity, for example for grain crops, reveals a rather close link existing between them. The soil cover quality established during an appraisal, similar to land productivity, can and must be raised. A rather rich but only infrequently used arsenal of methods is available for influencing not only the soil but also the soil's ecological system -- a plant on the whole, including correct placement of the agricultural crops. These then constitute the most substantial reserves for raising land productivity.

Prior to examining these reserves, it is noted that despite the very large area of Western Siberia, agricultural land constitutes only 14.4 percent and arable land only 8.06 percent of the territory. All of the remaining area is occupied by forests or swamps, the draining of which requires tremendous capital investments, or solonchak or solonetz soils, which also require expensive land reclamation operations. There is practically no land in Western Siberia suitable for the expansion of agricultural lands, and particularly the arable land, in the absence of complicated and very costly land reclamation work. For example, according to computations which we carried out assisted by the Institute of Agricultural Economics of the Siberian Branch of VASKhNIL, by 1980 it will be possible to increase the arable land area in Novosibirskaya Oblast, in the absence of substantial land reclamation work, by no more than 100,000 hectares. This will be accomplished mainly by plowing up small patches of idle land, clearing away tracts of brush land plowing up haying and pasture lands located on good soils.

Thus, one principal and substantial means for raising the production of agricultural products is that of agricultural intensification -- carried out extensively in our country based upon a more extensive and complete use of soil fertility reserves, both natural and created.

Here it is appropriate to mention the words uttered by the General Secretary of the CC CPSU L.I. Brezhnev, who stated: "Land is a priceless national wealth and we are obligated to protect it, to raise its productivity and to obtain increased yields from each hectare"*.

Allow me to cite some significant facts illustrating the productivity of agricultural lands which is dependent only upon the use of mineral fertilizers.

According to data accumulated over a period of many years, 10 kg of grain are obtained for an average quality index in Novosibriskaya Oblast where mineral fertilizers are employed only weakly, whereas more than 20 kg of grain are being obtained in Tomskaya Oblast from a smaller area under crops but with fertilizers being employed. Under identical natural conditions in Kolyvanskiy Rayon of Novosibirskaya Oblast, for 1 average point of quality index the soils of the general agricultural use group produce 13 kg of grain, whereas in Kozhevnikovskiy Rayon of Tomskaya Oblast -- more than 20 kg. Almost identical soil cover quality indices were recorded for Maslyaninskiy and Bolotninskiy rayons of Novosibirskaya Oblast (72 and 75 points respectively), which enjoy roughly the same natural conditions. However, in Maslyaninskiy Rayon, owing to the extensive use of mineral fertilizers, almost two times more grain is being obtained per average point of quality index than in Bolotininskiy Rayon. When mineral fertilizers are applied at state strain testing stations, even in small dosages, the grain yields obtained are 1.5-2 times higher than those from the fields of neighboring kolkhozes and sovkhozes. All of this underscores the fact that

* L.I. Brezhnev. "Leninskim Kursom" [Following Lenin's Policy], Vol 4, Moscow, 1974, p 451.

the most important reserve for raising productivity must be that of mineral and organic fertilizers, the waste products of poultry factories, the available and abundant beds of peat and the sapropels of numerous lakes.

At the same time, it should be borne in mind that the existing system of utilizing land with no fertilizer being applied results not only in low productivity for the crops grown. In addition, it leads to exhaustion of the soil, particularly the chernozem soils on which grain crops are grown in an intensive manner. These soils lose their fertility as a result of the irrevocable withdrawal of nutrients with a harvest. Fertilizers and the methods for employing them play a very special role in Western Siberia. At the present time, it is impossible to raise the productivity of the Siberian fields sharply in the absence of fertilizer usage.

The role played by fertilizers can be very diverse in nature. Thus, under the specific ecological conditions found in Western Siberia, new aspects of fertilizer action are coming to light, aspects which were unknown in the more favorable atmosphere for agricultural production found in the European part of the country.

Thus, fertilizers applied during the spring in Western Siberia reduce the period between sowing and the appearance of seedlings and they raise the resistance of the plants against low and at times high temperatures, rot and droughts. Fertilizers applied during the summer make it possible to control the growth and leaf surface formation processes, the utilization of the favorable radiation conditions found in Siberia and to achieve more economic consumption of the limited supplies of soil moisture and the accumulation of the principal reserves of organic substances in the plants. In the autumn the fertilizers may be the means for accelerating the often delayed ripening of the crops (senication).

The oblasts of Western Siberia are still obtaining very little fertilizer. For example, during the 1971-1972 period they were supplied with approximately 10 kg of nitrogen, phosphorus and potassium per hectare of arable land. But even this small quantity of fertilizer is by no means always being used in the correct manner. The principal portion is being applied to the vegetable crops, with the grain crops receiving insufficient amounts of fertilizer. It is believed that the grain crops are being grown on the best lands and that these lands do not require large quantities of fertilizer. Meanwhile, grain crops are also being grown on poor soils. Such soils require mineral top dressings. The primary nutrient ratios recommended by the scientific institutes, including the Institute of Soil Science and Agrochemistry of the Siberian Branch of the USSR Academy of Sciences (IPA) are not always being followed during fertilizer deliveries and applications.

Considering the small quantities of mineral fertilizers being supplied to Novosibirskaya Oblast, it is not considered advisable to apply them in arid regions on the same basis as in damp regions, where the return from the use of fertilizers is certainly higher.

The results obtained by scientific-research institutes during the past few years convincingly underscore the need for radically changing the strategy for fertilizer usage. It is believed that fertilizers should ideally be applied in small dosages only on well moistened soils that are weak in nutrients. On rich soils the fertilizers should be applied in large dosages and in a concentrated manner. In this regard, some experiments carried out at IPA are of interest. An application of fertilizers to leached chernozem in a dosage corresponding to one half of the nutrients withdrawn did not produce an increase in yield. In this instance, similar to when low dosages of fertilizers were applied to the fields of a sovkhoz, the spring wheat productivity was 20 quintals per hectare. Higher dosages corresponding to 1-1.5 times the nutrient withdrawal raised the wheat productivity to 25-30 quintals per hectare. Similar results were obtained for other crops. Thus, high fertilizer dosages made it possible to obtain 282 quintals of potatoes per hectare instead of 78 on the sovkhoz fields, corn -- 513 quintals per hectare instead of 172 and clover for hay -- 59 quintals per hectare instead of 32. An analysis of the economic efficiency revealed that the use of high dosages of fertilizers justified expenses completely from both a physical and monetary standpoint.

The intensive corn crop method developed by IPA underscores the possibility of raising the productivity of land sharply through the use of fertilizers.

From year to year the average corn fodder productivity for Siberia, against a non-fertilization background, ranges from 100-120 quintals per hectare. Experiments have shown that on non-irrigated land, by applying high dosages of fertilizers (nitrogen -- up to 150, phosphorus -- 80-100 and potassium -- up to 150 kg per hectare) combined with packing the plant stand to 200,000-250,000 plants per hectare, the corn productivity under production conditions can be raised to 300 quintals per hectare. Under irrigation conditions, a crowded sowing (300,000-350,000 plants per hectare) with corresponding dosages of fertilizers makes it possible to raise the productivity to 700-800 quintals of fodder per hectare.

The mentioned method, introduced at several farms in Novosibirskaya and Kemerovskaya oblasts, improved the quality of the fodder and increased the eatability of the silage by the livestock by roughly 20 percent.

The extensive use of intensive corn cultivation will make it possible in the near future not only to strengthen sharply the feed base for livestock husbandry but also to release considerable areas of fertile lands for use in behalf of other important crops.

Very little use is being made of microfertilizers despite the fact that they are relatively easy to obtain and effective when applied correctly. A mandatory condition for using microfertilizers must be that of combining them with macrofertilizers.

The difficulties which arise in connection with supplying the farms with mineral fertilizers could be blunted somewhat initially through the more

complete use of local fertilizers, mainly farmyard manure prepared using the so-called Siberian method, which was technologically well developed and proposed for production operations by the Institute of Soil Science and Agrochemistry of the Siberian Branch of the USSR Academy of Sciences and Sibgiprosel'khozstroy. Extensive use must also be made of other organic fertilizers.

The arsenal of practical recommendations also includes methods for affecting the plants directly.

Over a period of many years, IPA, jointly with the Central Siberian Botanical Garden, has been testing under production conditions a method for accelerating the ripening of potatoes and wheat. The essence of this method consists of a potato field being treated at the end of the growing season with a 25 percent solution of superphosphate supplemented by a 0.01 percent solution of 2.4-D and the wheat -- with a 5 percent water solution of ammonium sulphate at a rate of up to 500 liters per hectare. The increase in potato yield obtained while simultaneously improving their quality, depending upon the weather conditions and the level of agricultural practices employed, amounts to 25-50 percent, with a partial return of up to 20 rubles for each ruble expended. The treatment of the wheat makes it possible to accelerate the ripening process, raise the protein content of the grain and increase the yield by 1.5-2.5 quintals per hectare.

We have already mentioned senication. This method is based upon the principle that once natural aging commences growth may come to a halt, the disintegration of complex compounds may be accelerated and outflow is intensified by spraying the plants with solutions of the usual fertilizers, in the required concentration and in combination with small dosages of 2.4-D.

The method of accelerating the ripening process must, in the near future, become a part of the daily operational practice of farms.

Further development of a technology for the new agricultural methods and, a factor which is of special importance, its rapid introduction into operations -- is considered to be an important element for the intensification of agricultural crops in Siberia, which is characterized by extremely unfavorable conditions during the crop harvesting period.

The method of complex pre-sowing treatment of wheat seed using chloro-choline chloride with s is considered to be a very promising one for Siberia. The method arouses interest in view of the fact that it does not require special expenditures for carrying it out, since the treatment with chloro-choline chloride combined with treatment involving the use of standard disinfectants. When the seed is treated using a dosage of 2 kg of active agent per ton of grain, an increase takes place in the resistance of the wheat against lodging, sharp drops in temperature, rapid drying out of the upper layers of soil and against destruction by root rot.

Water erosion causes an extreme amount of damage to soils and their potential fertility and productivity in Western Siberia, in regions having broken relief, whereas wind erosion adversely affects steppe and plains regions, particularly those having soils of a light mechanical composition. Strong destruction of the more valuable soils takes place and this affects adversely and noticeably the productivity of the agricultural crops. The campaign against water erosion merits greater attention. Studies carried out at IPA made it possible to uncover the peculiarities of the water erosion processes taking place in Western Siberia, with its deep-freezing soils, and to introduce proposals for combating this erosion. These proposals are based upon a system of anti-erosion measures introduced at certain farms in Western Siberia and a general plan for anti-erosion measures throughout Novosibirskaya Oblast, composed by Rostgiprozem Planning Institute with the participation of IPA.

The campaign against wind erosion includes many efficient measures, including special, well known agricultural methods, sowings of perennial grasses, field-protective forestation and other measures developed by the country's scientific-research institutes.

A most important task with regard to eliminating soil erosion is that of rapidly introducing an overall campaign against it, including the construction of special hydraulic engineering installations. A requirement already exists at the present time for at least carrying out those measures which do not require substantial expenditures.

The fertility of soils and the productivity of agricultural crops are determined to a considerable degree by the natural resources of heat and moisture and by the level and effectiveness of use in farming of these most important yield factors.

The heat resources in Novosibirskaya Oblast are on the average sufficient for obtaining high grain crop yields. However, the practical realization of this potential is limited to 70 percent of the arable land fund in the oblast, owing to the shortage of atmospheric and soil moisture during the growing season for the agricultural crops.

At the same time, at study of the structure of the water balance of the arable soils and the natural moisture resources has shown that the soil moisture resources are by no means being utilized to the fullest possible degree in farming. It is sufficient to state that more than one half of the autumn, winter and spring precipitation does not accumulate in the soils but rather is lost as a result of physical evaporation, the winter removal of snow by the wind and surface runoff. These losses amount to from 800 to 1,200 cubic meters per hectare in the steppe and forest-steppe zones, which in a conversion for possible wheat grain yield represents a loss of from 8 to 12 quintals per hectare. The productive losses of moisture are also considerable during the summer period, constituting 40-50 percent for the

grain crops and even as much as 60-65 percent of the total amount of moisture consumed for the row crops. However, the unproductive moisture losses mentioned above represent a substantial reserve for improving the water regime of soils and raising the availability of moisture for the plants.

It must be emphasized that optimization of the water regime for soils alone will not guarantee that high and good quality crop yields will be obtained. Even in the face of a weakly controlled water regime, the total amount of moisture expended in behalf of grain crops in the Kulunda Steppe zone amounts on the average to 2,000 cubic meters per hectare and in the Barabinsk and Priob'ye zones -- 2,500-2,750 cubic meters per hectare. Nevertheless, these rather high expenditures do not ensure annually stable yields owing to the low fertility of the old arable lands. Thus, an indispensable condition for raising the productivity of arable soils is that of applying mineral and organic fertilizers to them. During experiments carried out at IPA in 1973, fertilized wheat consumed 30 cubic meters less water for the creation of 1 quintal of grain than did non-fertilized wheat. As a result and for an identical total amount of moisture consumption, an increase in yield of 8 quintals per hectare was obtained. Improvements in the effectiveness of utilization of heat and moisture resources by the agricultural crops are promoted by such measures as the creation, by means of cultivation, of an optimum consistency and texture for the arable layer, waging a campaign against weeds, selecting highly productive varieties and others.

The extensive distribution throughout Novosibirskaya Oblast of low productivity lands (water-logged, saline and alkaline) persistently requires the carrying out of large-scale land reclamation operations. The general direction to be followed in carrying out such work must be determined based upon the landscape features of the territory. In the northern part of the oblast, which is subject to considerable water-logging and characterized by podzolic soils, good prospects exist for drainage types of land reclamation work and for the liming of soils having definite acid reactions. These actions will aid in eliminating the unfavorable growth conditions for cultivated plants. Owing to the extensive nature of the swamps involved, the carrying out of land reclamation drainage work is viewed as an extremely laborious operation and one requiring tremendous capital investments. In all probability, it is a task that will be continued for some time into the future. Distinct from the latter work, liming operations can be viewed as a long-term method for improving the status of fertile soils. However, it can be employed only on limited areas of strongly podzolic soils. The principal portion of the arable lands in this zone does not require lime applications.

A more important task is that of carrying out land reclamation work on solonetz lands, which occupy more than 10 million hectares in Western Siberia. Studies of these soils, carried out during various years at IPA, the Siberian Scientific Research Institute of Agricultural Mechanization of the

Siberian Branch of VASKhNIL and the Central Siberian Botanical Garden have convincingly revealed that these soils can be utilized most effectively as cultivated haying or pasture lands, which will be especially highly productive if gypsum is applied and irrigation employed. For irrigation in the zone of solonetz soils, extensive use can be made of the water from lakes and underground sources.

Thus, an overall review of the status and prospects for utilizing the land resources of Siberia reveals that the most important task of agricultural production is that of making correct use of the principal wealth -- the land available -- and introducing scientifically sound methods for raising the productivity of the land areas into operational practice on an extensive basis and in a planned manner.

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